REMARKS

Claims 41, 43-45, 47 and 50 are amended. Claims 41 and 43-52 are pending in the application.

Claims 41 and 43-51 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor had possession of the claimed invention at the time the application was filed. With respect to base claim 41 the Examiner states that the recited "forming a metal comprising conductive gate electrode" is not supported by the specification. The Examiner further states that the recited oxidizing a portion of the gate electrode laterally adjacent the sidewall spacers and at an interface with the gate dielectric is not supported by the specification because the metal comprising gate electrode is not interfacing the gate dielectric layer and is not oxidized as disclosed and shown in Fig. 8. Without admission as to the propriety of the Examiner's statements, claim 41 is amended to recite a composite gate over a gate dielectric layer on a substrate, the composite gate comprising a polysilicon material, a metal comprising material layer and gate sidewalls. These recited features are specifically supported by the specification at, for example, page 4, lines 8-10; page 4, lines 15-19; page 5, lines 4-5; and page 5, line 14 through page 6, line 3. Accordingly, applicant respectfully requests withdrawal of the § 112, first paragraph, rejection of claim 41,and dependent claims 43-44 which depend therefrom, in the Examiner's next action.

With respect to claim 45, the Examiner states that the recited "gate structure comprising a metal comprising gate electrode" is not supported by the specification. As amended, claim 45 recites forming a conductive gate structure on a first layer, the

conductive gate structure having sidewalls and an interface with the first layer and comprising at least one metal comprising material and a conductive polysilicon layer. These recited features are specifically supported by the specification at, for example, those locations indicated above with respect to independent claim 41. Accordingly, applicant respectfully requests withdrawal of the § 112, first paragraph, rejection of claim 45 and its dependent claims 46-49 in the Examiner's next action.

With respect to claim 50, the Examiner states that the recited "forming a metal comprising conductive gate structure" is not supported by the specification. As amended, claim 50 recites forming a conductive gate structure having sidewalls which comprise a polysilicon material surface and a metal comprising surface. Claim 50 further recites forming a non-oxide material directly against the sidewalls along the polysilicon material surface and along the metal comprising surface. These recited features are specifically supported by the specification at, for example, those locations indicated above with respect to independent claim 41; and at page 6, line 23 through page 7, line 5; page 10, lines 10-17; Fig. 3; and Figs. 6-8 and the accompanying text. Accordingly, applicant respectfully requests withdrawal of the § 112, first paragraph, rejection of claims 50, and dependent claim 51 in the Examiner's next action.

Claims 41 and 43-52 stand rejected under 35 U.S.C. § 112, first paragraph, as lacking essential steps. The Examiner indicates at page 3 of the present Action that the absence of a limitation of an oxidation resistant insulative cap layer 30 is not reasonably enabled because the top of the gate structure would be exposed to oxidation conditions and would be oxidized, and that the claims recite that the only portion of the gate oxidized

is adjacent the spacers at the dielectric interface. The Examiner further states that the cap is necessarily essential to the practice of the invention.

Attention is directed to the applicant's specification at, for example, page 10, line 10 through page 11, line 5 which clearly indicates that cap 30 is formed in a preferred aspect to protect the gate top during oxidation exposure. Nowhere does the specification indicate that cap 30 is required. Applicant further notes with respect to independent claims 41 and 52 that neither of these two claims recites a limitation of oxidizing only a potion of gate structure adjacent the dielectric layer. Accordingly, independent claims 41 and 52 and corresponding dependant claims 43-33 are fully enabled by the specification.

With respect to independent claims 45 and 50, without admission as to the propriety of the Examiner's § 112, first paragraph, rejection of such claims, claims 45 and 50 are amended to recite an oxidation resistant cap. Accordingly, the § 112, first paragraph rejection of claims 45, 50 and corresponding dependent claims 46-49 and 51 is obviated.

Claims 41 and 43-52 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Verhaar, U.S. Patent No. 5,015,598, as combined with either Hiroki, U.S. Patent No. 5,512,771, or Kurimoto, U.S. Patent No. 5,306,655, and in further view of Pintchovski, U.S. Patent No. 5,126,283 and Park, U.S. Patent No. 5,545,578; or as being unpatentable over the combination of these references in further view of both Brigham, U.S. Patent No. 5,714,413, and Kumagai, U.S. Patent No. 5,430,313. The Examiner is reminded by direction to MPEP § 2143 that a proper obviousness rejection has the following three requirements: 1) there must be some suggestion or motivation to modify or combine reference teachings; 2) there must be a reasonable expectation of success; and 3) the combined references must teach or suggest all of the claim limitations. Each of

claims 41 and 53-52 are allowable over the various cited combinations of Verhaar, Hiroki, Kurimoto, Pintchovski, Park, Brigham and Kumagai for at least the reason that the references, individually or as combined, fail to disclose or suggest each and every limitation in any of those claims.

Referring initially to independent claim 41, such recites forming a composite gate over a gate dielectric layer, the composite gate comprising a polysilicon material layer, a metal-comprising material layer, and gate sidewalls. Claim 41 further recites sidewall spacers directly on the gate sidewalls and contacting the metal-comprising material and the polysilicon material, the sidewall spacers joining with the gate dielectric layer. As acknowledged by the Examiner at page 5 of the present Action, Verhaar does not disclose or suggest the claim 41 recited gate structure having a metal comprising material layer. Further, Verhaar does not disclose or suggest the claim 41 recited forming nitride comprising sidewall spacers directly on the gate sidewall and joining with the gate dielectric layer, the spacers contacting the metal-comprising material and polysilicon material.

Hiroki and Kurimoto are relied upon by the Examiner as showing formation of a "smiling gate", as indicated by the Examiner at page 4-5 of the present Action. Kurimoto discloses an intervening oxide material formed between a gate sidewall and a sidewall spacer (Fig. 13 and col. 13, ll. 42-48). Hiroki discloses formation of an oxide film on surfaces of a gate electrode and subsequent deposition of a nitride film over the intervening oxide film (col. 8, ll. 3-6 and col. 10, ll. 33-36). As combined with Verhaar, neither Hiroki nor Kurimoto contributes towards suggesting the claim 41 recited forming a nitride comprising sidewall spacer directly on gate sidewalls and contacting a metal-comprising material and a polysilicon material, the sidewall spacer joining with the gate

dielectric layer.

As indicated by the Examiner at page 6 of the present Action, each of Brigham and Kumagai are relied upon for showing double sidewall spacers. Brigham discloses forming an oxide layer over a polysilicon gate electrode and subsequently depositing a nitride layer over the intervening oxide layer (col. 3, ll. 31-32 and col. 4, ll. 60-67). Kumagai discloses forming an insulating film on the sides of a polysilicon gate electrode (col. 3, ll. 15-19). As combined with Verhaar in view of either Hiroki or Kurimoto, neither Brigham nor Kumagai contributes towards suggesting the claim 41 recited forming nitride comprising sidewall spacers directly on and in contact with metal comprising material and polysilicon material of a composite gate over a dielectric layer, the spacers joining the gate dielectric layer.

As indicated at page 5 of the present Action, Pintchovski and Park are relied upon as showing various gate structures having a polysilicon layer and a metal-comprising layer. With respect to Pintchovski, such does not disclose or suggest formation of nitride comprising sidewall spacers. As combined with Verhaar, Hiroki, Kurimoto, Brigham and Kumagai, Pintchovski does not contribute towards suggesting the claim 41 recited forming nitride comprising sidewall spacers directly on and contacting a metal-comprising material and a polysilicon material of a composite gate sidewall, the sidewall spacers joining with the gate dielectric layer.

With respect to Park, such discloses formation of a sidewall spacer 22a which is specifically formed to extend only partially along a polysilicon gate layer 14 (col. 4, ll. 58 through col. 5, line 14; and Figs. 4E-4F. Park specifies that the spacer 22a not extend to gate insulating layer 12 to allow exposure of lower portion of polysilicon gate layer 14 during oxidation. Accordingly, considered in combination with Verhaar, Pintchovski, Hiroki,

Kurimoto, Brigham and Kumagai, the deliberately exposed polysilicon gate layer of Park does not contribute towards suggesting the claim 41 recited nitride comprising sidewall spacers joining with the gate dielectric and contacting a metal-comprising material and a polysilicon material of a composite gate. Accordingly, independent claim 41 is not rendered obvious by the cited combinations of Verhaar, Hiroki, Kumagai, Pintchovski, Park Brigham and Kurimoto and is allowable over these references.

Dependent claims 43 and 44 are amended to properly depend from independent claim 41. Claims 43 and 44 are allowable over the various cited combinations of Verhaar, Hiroki, Kurimoto, Pintchovski, Park, Brigham and Kumagai for at least the reason that they depend from allowable base claim 41.

Independent claim 45 recites oxidation resistant sidewall spacers directly adjacent a conductive gate structure sidewall sufficiently to cover all conductive material comprised by the sidewalls, the conductive gate structure comprising at least one metal-comprising material and a conductive polysilicon layer. Independent claim 50 recites forming non-oxide material spacers along a polysilicon material surface and a metal comprising surface of gate sidewalls, the spacers joining with the gate dielectric layer. Independent claim 52 recites forming oxidation resistant materials covering all of the sidewalls of a gate structure comprising a polysilicon layer and an overlying metal layer. Each of independent claims 45, 50 and 52 are allowable over the various cited combinations of Verhaar, Hiroki, Kurimoto, Pintchovski, Park, Brigham and Kumagai for at least reasons similar to those discussed above with respect to independent claim 41.

Dependent claim 47 is amended to properly depend from independent claim 45. Dependent claims 46 through 49 and 51 are allowable over the various cited combinations

of Verhaar, Hiroki, Kurimoto, Pintchovski, Park, Brigham and Kumagai for at least the reason that they depend from corresponding allowable base claims 45 and 50.

For the reasons discussed above claims 41 and 43-52 are allowable. Accordingly, applicant respectfully requests formal allowance of pending claims 41 and 43-52 in the Examiner's next action.

Respectfully submitted,

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